ADDENDUM
TO
SOLID WASTE WATER QUALITY ASSESSMENT TEST (SWAT) SAMPLING PLAN

REMEDIAL INVESTIGATION/FEASIBILITY STUDY (RI / FS)
PHASES 5 AND 6
Volume 1A

Original: February 1990
Addendum: April 23, 1991

James M. Montgomery, Consulting Engineers, Inc. (JMM) will be performing a Solid Waste Water Quality Assessment Testing (SWAT) program investigation at Naval Air Station (NAS) Alameda as part of Navy CLEAN Contract Task Order (CTO) No. 107. This document is an addendum to the above referenced document which was prepared by Canonie Environmental (Canonie) and reflects modifications to the program.

1. Section 3.1.2.2, page 24, paragraph 1. Air rotary casing hammer rig will be used to eliminate conductor casing and possibly reduce the amount of time spent drilling.

2. Section 3.1.2.3, page 25, paragraph 4. Representative soil samples will be saved in archive boxes.

3. Section 3.1.2.3, page 25, paragraph 5. Brass tubes will be used for the collection of geotechnical samples from the top and bottom of screen intervals and at selected surface locations.

4. Section 3.1.2.3, page 26, paragraph 2. Liquinox detergent will be used for the cleaning of sampling equipment rather than Alconox. This change will reduce the possibility of phosphate contamination.

5. Section 3.1.2.3, page 26, paragraph 2. Laboratory grade isopropyl alcohol will be used instead of hexane as the rinsing agent. The waste isopropyl alcohol will be containerized and disposed along with the decontamination water. However, due to the high volatility of the isopropyl alcohol, it is expected only a minor amount will be contained.

6. Section 3.2.1, page 32 and Section 3.3.1, page 35. Soil borings and wells will be cleared and monitored with a Geiger-Mueller counter and photoionization detector (PID) prior to and during drilling.

7. Sections 3.2.1, 3.2.1.1., 3.3.1, 3.3.1.1, pages 35. Electromagnetics (EM) and ground penetrating radar (GPR) will be considered for use over specific areas in the West Beach Landfill to locate metal objects, drums, and inert ordnance.

8. Section 3.2.2.2, pages 31-32. The work plan states 34 intermediate wells will be installed around the perimeter of the West Beach Landfill, the 1943-1956 Disposal Area, and the Runway Area. However, 16 of 34 of these intermediate wells have been eliminated. Four of the remaining intermediate wells will be completed in the upper portion of the second water bearing zone in accordance to the Sampling Plan prepared by Canonie. The remaining 14 intermediate wells will have screen intervals placed in the base of the "Bay Mud Sand" and above the "Bay Mud

Aquitard" as described in the report titled Naval Air Station Alameda, California Hydrogeology and Proposed Changes for Phase 5 of the RI/FS, March 14, 1991. Further, two additional deep wells have been added. Well locations for phase 5 are shown in figure 1.

9. Section 3.2.2.2, page 32, paragraph 2. Sieve analysis and hydrometer methods will be performed on one sample from each lithologic unit at each well cluster and single shallow well location rather than at each boring location. However, this information will not be used for current well installation design.

10. Sections 3.2.2.2, page 32, paragraph 3 and 3.3.5, page 40, paragraph 2. Sediment samples will be taken in the San Francisco Bay immediately offshore from the 1943-1956 Disposal Area and the West Beach Landfill. These offshore sample locations will be evenly spaced along the bay shoreline using a line-of-sight and on-shore reference points. A buoy will be placed at each location immediately after sampling to permit surveyors to triangulate each location.

11. Section 3.2.3, page 33, paragraph 2 and Figure 3-7. Six-inch diameter wells will be installed instead of four inch diameter wells. If surface casing is used, the borehole will be 18 inches in diameter and 12 inches in diameter below the surface casing. If no surface casing is required, then the borehole will be 12 inches in diameter.

12. Section 3.3.2, pages 37-38. A grid with 200-foot spacing will be set up over the West Beach Landfill study area. Grid node points will be used as a basis for surface soil sample locations. However, should some of the selected sample grid node points fall over a water body within the West Beach Landfill study area, no soil sample will be taken. The soil samples will be collected from a depth of 0 to 6 inches with a stainless steel sampling device.

13. Section 3.3.5, pages 39-40. The wetlands area is located in the southwest corner of the West Beach Landfill. Sampling in this area will consist of grabbing a total of 12 soil sediment and 24 surface water samples. The surface water samples will be taken prior to the sampling of the soil sediments to prevent mixing the bottom sediments into the water samples.

14. Tables 3-1 through 3-4. Several modifications have been made to analytical requirements for the investigation. Oil and grease analysis will be performed for all well boring surface soil samples. However, only one surface sample will be taken and analyzed at each well cluster. A total of 34 surface soil samples will be taken. Uranium, orthophosphate pesticides, and chlorinated herbicides analysis for all water, soil, and sediment samples have been removed as requested by the Navy in December 1990.

15. Tables 3-1 through 3-3. See the attached Tables 3-1 through 3-3 for changes listed below.

    a. Radium 226 and 228 have replaced the U226 and U228 analyses.

    b. Total Recoverable Petroleum Hydrocarbons (TRPH) has replaced the oil and grease analysis. However, both oil and grease and TRPH will be determined in surface samples from well borings.

    c. Mercury, and selenium are included in Hazardous Substance List Metals analysis.

    d. Air samples will not be performed during this phase.

TABLE 3-1

SAMPLE TYPES AND ANALYSES/RATIONALE FOR 1943-1956 DISPOSAL AREA

Sample Matrix	Analysis	Rationale
Soils		
Surface Soil Samples	BNA extractables	Paints
	Pesticides/PCBs	Waste oils
	Metals	Scrap metals
	Gross Alpha and Beta	Radiological waste
	U226 and U228 [a]	Radiological waste
	Gradation	Disposal Treatment Isolation
	Permeability	Describe fate and transport
Split Spoon Samples	VOA	Solvents/cleaning compounds
	BNA extractables	Paints
	Pesticides/PCBs	Waste oils
	Metals	Scrap metals
	Gross Alpha and Beta	Radiological waste
	U226 and U228 [a]	Radiological waste
	Asbestos	
	Mercury [c]	
	pH	
	TOC	
Thin-Walled Tube Samples	Gradation	Disposal Treatment Isolation
	Atterberg limits	Disposal Treatment Isolation
	Modified Proctor compaction	Evaluate disposal options
	Water content/Dry density	Affects treatment method
	Specific gravity	Indicates density
	One-dimensional consolidation	Evaluate disposal options
	Permeability	Describe fate and transport
Ground Water	VOA	Solvents/cleaning compounds
	BNA extractables	Paints
	Pesticides/PCBs	Waste oils
	Oil and Grease [b]	Waste oils
	Metals	Scrap metals
	Mercury [c]	Detected in Pan Am well
	Gross Alpha and Beta	Radiological waste
	U226 and U228	Radiological waste
	Chemical oxygen demand (COD)	Likely that significant chemical concentrations exist
	Asbestos	Building construction waste
	General Minerals	Evaluate potable water and sea water intrusion
	Chloride	Indicator parameter
	Nitrate	Indicator parameter
	Fluoride	Indicator parameter
	Cyanide [c]	Indicator parameter
	Hardness	Affects treatment method

TABLE 3-1

SAMPLE TYPES AND ANALYSES/RATIONALE FOR 1943-1956 DISPOSAL AREA
(Continued)

Sample matrix	Analysis	Rationale
Ground Water (Continued)	Alkalinity	General treatment information
	Total dissolved solids (TDS)	General treatment information
	Total organic carbon (TOC)	Evaluate treatment options
	Dissolved oxygen	Describe fate and transport
	Acidity	General treatment information
	Specific conductance	Describe fate and transport
	Temperature	Indicator parameter
	pH	Indicator parameter
	Salinity	Indicator parameter
Air[d]	VOA	Solvents/cleaning compounds
	BNA extractables	Paints
	Metals	Scrap metals

Note: VOAs will only be analyzed in split spoon samples obtained below surface soils.

TABLE 3-2

SAMPLE TYPES AND ANALYSES/RATIONALE FOR WEST BEACH LANDFILL

Sample Matrix	Analyses	Rationale
Soils		
Surface Soil Samples	BNA extractables	Paints
	Pesticides/PCBs	Waste oils
	Metals	Scrap metals
	Gross Alpha and Beta	Radiological waste
	U226 and U228 [d]	Radiological waste
	Gradation	Disposal Treatment Isolation
	Permeability	Describe fate and transport
Split Spoon Samples	VOA	Paint strippers
	BNA extractables	Paint strippers
	Pesticides/PCBs	Pesticides/PCB waste oil
	Metals	Industrial waste
	Gross Alpha and Beta	Radiological waste
	U226 and U228 [a]	Radiological waste
	Asbestos	
	Mercury [c]	
	pH	
	TOC	
Thin-Walled Tube Samples	Gradation	Disposal treatment isolation
	Atterberg Limits	Disposal treatment isolation
	Modified Proctor compaction	Evaluate disposal options
	Water content/Dry density	Affects treatment method
	Specific gravity	Indicates density
	One-dimensional consolidation	Evaluate disposal options
	Permeability	Describe fate and transport
Ground Water	VOA	Paint strippers
	BNA extractables	Paint strippers
	Pesticides/PCBs	Pesticides/PCB waste oil
	Oil and Grease [b]	Waste oils
	Metals	Industrial Waste
	Mercury [c]	Detected in Pan Am well
	Gross Alpha and Beta	
	Asbestos	
	Cyanide [c]	
	Chemical oxygen demand (COD)	Indicator parameter
	General Minerals	Evaluate potable water and sea water intrusion
	Chloride	Indicator parameter
	Nitrate	Indicator parameter
	Hardness	Affects treatment method
	Alkalinity	General treatment informatio
	Total dissolved solids (TDS)	General treatment informatio
	Total organic carbon (TOC)	Evaluate treatment options

TABLE 3-2

SAMPLE TYPES AND ANALYSES/RATIONALE FOR WEST BEACH LANDFILL
(Continued)

Sample Matrix	Analyses	Rationale
Ground Water (Continued)	Acidity	General treatment information
	Specific conductance	Describe fate and transport
	Temperature	Indicator parameter
	pH	Indicator parameter
	Salinity	Indicator parameter
	Dissolved oxygen	Describe fate and transport

Note: VOAs will only be analyzed in split spoon samples obtained below surface soils.

TABLE 3-3

SAMPLE TYPES AND ANALYSES/RATIONALE FOR WEST BEACH LANDFILL WETLAND AREA

Sample Matrix	Analyses	Rationale
Sediment	VOA BNA extractables Metals Pesticides/PCBs Oil and grease[b] TOC Bioassays Bioaccumulation studies	To determine the potential risks to wildlife populati that live or feed in wetla areas
Surface Water	VOA BNA extractables Metals Pesticides/PCBs Oil and grease[b] General minerals Hardness Salinity pH TOC Dissolved oxygen	To determine the potential risks to wildlife populati that live or feed in wetla areas
Benthic Species	VOA BNA extractables Pesticides/PCBs Metals	Due to the hazardous character of the waste streams entering the lagoo

Notes:

1. VOA indicates volatile organic analysis.
2. BNA indicates base, neutral, and acid.
3. TOC indicates total organic carbon.

MODIFICATION OF TABLE 3-4

ANALYTICAL METHODS

Chemical Class	Matrix	Method	Reference
Volatile Organics	Water	CLP SAS	(1)
	Soil	CLP RAS	(2)
Base/Neutrals and Acid Extractables	Water	CLP RAS	(2)
	Soil	CLP RAS	(2)
Pesticides/PCBs	Water	CLP RAS	(2)
	Soil	CLP RAS	(2)
Oil and Grease	Soil	9071/413.1	(3/4)
Hazardous Substance List Metals	Water	CLP RAS	(2)
	Soil	CLP RAS	(2)
Gross Alpha & Beta Radioactivity	Water	900.0	(5)
	Soil	9310	(3)
Radium 226 and 228	Water	706/7	(5)
	Soil	9310	(3)
COD	Water	SAS/410.1	(4)
Chloride	Water	SAS/300	(6)
Fluoride	Water	SAS/300	(6)
Nitrate/Nitrite-N	Water	SAS/353.2	
TOC	Water	SAS/415.2	(4)
	Soil	9060	(3)
Total Recoverable Petroleum Hydrocarbons	Water	418.1	(4)
	Soil	9071/418.1	(3/4)
Asbestos	Water	NIOSH 7402	--
	Soil	NIOSH 7403	--
pH	Soil	9040	(3)
Hardness	Water	SAS/130.2	(4)
TDS	Water	SAS/160.1	(4)
Acidity	Water	SAS/305.1	(4)
Alkalinity	Water	SAS/SM403	(7)

References:

1. EPA Contract Laboratory Program (CLP) Statement of Work, Special Analytical Services (SAS). Analysis does not include quantification of tentatively indentified compounds (TICs).

2. EPA CLP Statement of Work, Routine Analytical Services (RAS). Analysis does not include quantification of TICs.

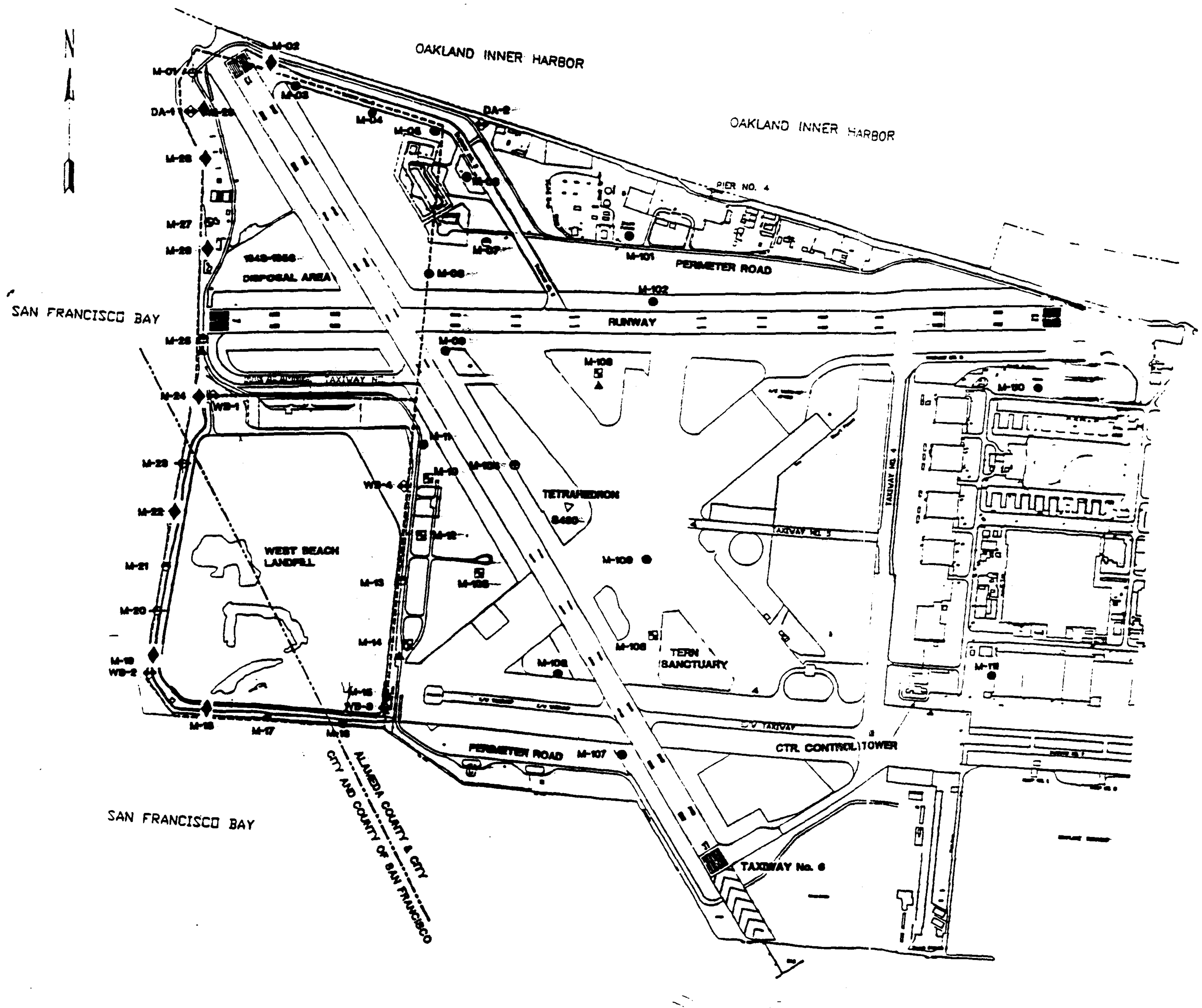
3. SW-846, Test Methods for Evaluating Solid Waste, 3rd Edition, U.S. EPA, Office of Solid Waste and Emergency Response, Washington, DC, July 1982. Revised November 1986.

4. Methods for Chemical Analysis of Water and Wastes, EPA-600/4-79-020, U.S. EPA, Environmental Monitoring and Support Laboratory, Cincinnati, Ohio, March 1979. Revised March 1984.

5. Prescribed Procedures for the Measurement of Radioactivity in Drinking Water, EPA 600/4-80-032, U.S. EPA, Environmental Monitoring and Support Laboratory, Las Vegas, 1982.

6. Test Methods, The Determination of Inorganic Anions in Water by Ion Chromatography - Method 300, U.S. EPA, 600/4-84-017, March 1984.

7. Standard Methods for the Examination of Waste and Wastewater, American Public Health Association, Washington, DC, 16th Edition.


N
OAKLAND INNER HARBOR
OAKLAND INNER HARBOR
PIER NO. 4
SAN FRANCISCO BAY
SAN FRANCISCO BAY
M-01
M-02
M-03
M-04
M-05
M-06
M-07
M-08
M-09
M-11
M-12
M-13
M-14
M-15
M-16
M-17
M-18
M-19
M-20
M-21
M-22
M-23
M-24
M-25
M-26
M-27
M-28
M-101
M-102
M-106
M-107
M-108
M-109
DA-1
DA-2
WB-1
WB-2
WB-3
WB-4
1943-1956
DISPOSAL AREA
PERIMETER ROAD
RUNWAY
TAXIWAY No. 3
TAXIWAY No. 4
TAXIWAY No. 6
TETRAHEDRON
WEST BEACH
LANDFILL
TERN
SANCTUARY
CTR. CONTROL TOWER
PERIMETER ROAD
ALAMEDA COUNTY & CITY
CITY AND COUNTY OF SAN FRANCISCO

LEGEND

- ● [illegible]
- ◆ [illegible]
- [illegible]
- [illegible]
- [illegible]
- ▲ [illegible]
- [illegible] drilled by Canonie, May 1990.
- [illegible] drilled by JMM, Nov. and Dec. 1990. Each site has two wells: [illegible]

SCALE IN FEET

500 0 500 1,000

GROUNDWATER MONITOR WELL LOCATIONS
NAVAL AIR STATION
ALAMEDA, CALIFORNIA

PREPARED FOR

WESTERN DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
SAN BRUNO, CALIFORNIA

JAMES M. MONTGOMERY
CONSULTING ENGINEERS, INC.

MARCH 1991

Figure 1

FINAL SAMPLING PLAN, SOLID WASTE ASSESSMENT TEST PROPOSAL ADDENDUM REMEDIAL INVESTIGATION/FEASIBILITY STUDY VOLUME 1A

DATED 01 FEBRUARY 1990

IS ENTERED IN THE DATABASE AND FILED AT ADMINISTRATIVE RECORD NO. **N00236.000786**